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**APPLICATION**

**FOR UNITED STATES LETTERS PATENT**

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**SPECIFICATION**

TO ALL WHOM IT MAY CONCERN:

BE IT KNOWN THAT I, **AL HARRIS**, a citizen of UNITED STATES OF AMERICA, have invented a new and useful **METAL DETECTION SYSTEM WITH A MAGNETOMETER HEAD COUPLEABLE TO CONVENTIONAL FOOTWARE AND METHOD OF USE** of which the following is a specification:

METAL DETECTION SYSTEM WITH A MAGNETOMETER HEAD  
COUPLEABLE TO CONVENTIONAL FOOTWARE AND METHOD  
OF USE

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**BACKGROUND OF THE INVENTION**

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**Field of the Invention**

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The present invention relates to metal detectors and more particularly pertains to a new metal detection system with a magnetometer head coupleable to conventional footwear and method of use for facilitating hands-free detection of metals below a surface of the ground adjacent to a user.

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**Description of the Prior Art**

The use of metal detectors and shoe-mounted electronics is known in the prior art. Illustrative examples include U.S. Patent No. 3,947,756; U.S. Patent No. 6,286,235; and U.S. Patent No. 6,408,545.

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While these devices fulfill their respective, particular objectives and requirements, the need remains for a system that allows hands-free operation of the magnetometer assembly and provides greater flexibility of operation for the user.

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## SUMMARY OF THE INVENTION

An advantage of the present invention is its operational  
5 capability of scanning an area behind the user for treasure hunting,  
or an area ahead of the user for either treasure hunting, line  
detection or mine detection.

Another advantage of the present invention is audio signaling  
10 corresponding with the detection of metal below the surface  
allowing the user to look at the surrounding environment rather than  
at a control panel or indicator meter.

Yet another advantage of the present invention is the  
15 capability of using a single system coupled to one piece of  
conventional footwear, or using two systems, each coupled to an  
associated piece of conventional footwear thereby doubling the  
effective area covered.

20 To this end, the present invention generally comprises a  
magnetometer assembly, a control assembly, and a coupling  
assembly. The magnetometer assembly is designed for passing over  
a surface and detecting metal below the surface. The control  
assembly is operationally coupled to the magnetometer assembly,  
25 and facilitates operational control of the magnetometer assembly.  
The coupling assembly operationally couples the magnetometer  
assembly to a piece of conventional footwear.

There has thus been outlined, rather broadly, the more  
30 important features of the invention in order that the detailed  
description thereof that follows may be better understood, and in  
order that the present contribution to the art may be better

appreciated. There are additional features of the invention that will be described hereinafter and which will form the subject matter of the claims appended hereto.

5           The objects of the invention, along with the various features of novelty which characterize the invention, are pointed out with particularity in the claims annexed to and forming a part of this disclosure.

## 10   **BRIEF DESCRIPTION OF THE DRAWINGS**

          The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such  
15   description makes reference to the annexed drawings wherein:

          Figure 1 is a schematic perspective view of a new metal detection system with a magnetometer head coupleable to conventional footwear and method of use according to the present  
20   invention.

          Figure 2 is a schematic perspective view of the present invention in use.

25           Figure 3 is a schematic functional interconnect diagram of the present invention.

          Figure 4 is a schematic functional interconnect diagram of the present invention using a cable assembly to provide a  
30   communications channel between the magnetometer assembly and the control assembly.

## DESCRIPTION OF THE PREFERRED EMBODIMENT

5       With reference now to the drawings, and in particular to  
Figures 1 through 4 thereof, a new metal detection system with a  
magnetometer head coupleable to conventional footwear and method  
of use embodying the principles and concepts of the present  
invention and generally designated by the reference numeral 10 will  
10 be described.

As best illustrated in Figures 1 through 4, the metal detection  
system with a magnetometer head coupleable to conventional  
footwear and method of use 10 generally comprises a magnetometer  
15 assembly 20, a control assembly 30, and a coupling means 40.

The magnetometer assembly 20 is designed for passing over a  
surface and detecting metal below the surface. The control  
assembly 30 is operationally coupled to the magnetometer assembly  
20 20, and facilitates operational control of the magnetometer  
assembly 20. The coupling means 40 operationally couples the  
magnetometer assembly 20 to a piece of conventional footwear 2.

Preferably the control assembly 30 further comprises a  
25 housing 32, which may be coupled (coupleable) to an article of  
clothing of a user facilitating hands-free operation. Suitable  
articles of clothing include, but certainly are not limited to belts,  
vests, shirts, pants, hats, headbands, or any other article of clothing  
which may conveniently retain the housing 32.

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The coupling means 40 may be any number of devices or mechanisms to either selectively or permanently coupled the magnetometer assembly to the conventional footwear 2. These might include, but at not limited to straps, belts, screws, buttons, snaps, adhesives, zippers, rivets, or other suitable devices. Preferably, the coupling means 40 includes a strap assembly 41 designed for is secured around a heel portion of the conventional footwear 2. The strap assembly 41 includes a first end 42 positionable adjacent to a first side of the conventional footwear 2. The strap assembly 41 also includes a second end 43 positionable along a second side of the conventional footwear 2 and over a top of the conventional footwear 2. The second end 43 is selectively securable to the first end 42. Thus, the strap assembly 41 is selectively secured to the conventional footwear 2.

While any number of methods may be used to selectively secure the first end of the strap assembly 41 to the second end of the strap assembly 41, such as buttons, snaps, buckles, zippers and the like, the preferred method is hook and loop fastener.

Preferably, the strap assembly 41 further comprises a first portion of hook and loop fastener 44 operationally coupled to the first end 42 of the strap assembly 41 and a second portion of hook and loop fastener 45 operationally coupled to the second end 43 of the strap assembly 41. The first portion of hook and loop fastener 44 is complementary to the second portion of hook and loop fastener 45.

The magnetometer assembly 20 may be in communication with the control assembly 30 either through a wired connection or a wireless connection.

In at least one embodiment the control assembly 30 further comprises an aural alert generator 34. The aural alert generator 34 emits an aural alert when the magnetometer assembly 20 detects  
5 metal. The aural alert generator 34 facilitates signaling the user of a presence of metal below the magnetometer assembly 20.

In a further embodiment, an extension means 50 is  
10 operationally coupled between the strap assembly 41 and the magnetometer assembly 20. The extension means 50 facilitates placement of the magnetometer assembly 20 away from a foot of a user. Preferably, the extension means 50 further comprises a horizontal extent 52 and a vertical extent 54. The horizontal extent  
15 52 includes a first end operationally coupled to the strap assembly 41. The horizontal extent 52 facilitates holding the magnetometer assembly 20 at a predetermined lateral distance from the foot of the user. The vertical extent 54 may be operationally coupled between a second end of the horizontal extent 52 and the magnetometer  
20 assembly 20. The vertical extent 54 facilitates a vertical placement of the magnetometer assembly 20 above a surface.

In still a further embodiment the extension means 50 is designed for positioning the magnetometer assembly 20 in front of  
25 the user.

With respect to the above description then, it is to be realized that the optimum dimensional relationships for the parts of the invention, to include variations in size, materials, shape, form,  
30 function and manner of operation, assembly and use, are deemed readily apparent and obvious to one skilled in the art, and all

equivalent relationships to those illustrated in the drawings and described in the specification are intended to be encompassed by the present invention.

5           Therefore, the foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable  
10   modifications and equivalents may be resorted to, falling within the scope of the invention.